

**Evidence-based Opioid Guidance in Acute Care:
An Initiative for Advocating Provider Stewardship**

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Abstract

Introduction/Purpose: The purpose of this project was to improve providers' knowledge and utilization of the Prescription Drug Monitoring Program (PDMP) and World Health Organization (WHO) pain ladder when prescribing opioid pain relievers in the inpatient setting.

Methods: Fifteen providers, a mix of physicians and nurse practitioners, in the inpatient setting were recruited to participate in the project. The investigator provided one on one educational sessions regarding the utilization and importance of the PDMP and WHO pain ladder. Providers who have a Drug Enforcement Agency (DEA) license were eligible for participation while providers without a DEA license were excluded. Providers took a pre-test that measured providers' perceptions on their knowledge regarding the PDMP and WHO pain ladder. Providers then received a brief online educational session regarding the importance of the PDMP and WHO pain ladder. Following the education sessions, providers were given six weeks to implement their knowledge regarding the utilization of the PDMP and WHO pain ladder into practice to see if it affects their prescribing behaviors of opioid pain relievers. After the six-week period, providers were sent a link to a post-education test that looked at their perception regarding knowledge gained during the project.

Results: A total of 15 participants were recruited for the project at baseline. Ten providers completed the initial survey but failed to complete the pre and post-education surveys. Fifty percent (n=5) of the participants completed the project in full. The lack of participation is assumed to be due to the surge in COVID-19 cases when the project gained approval and began implementation. Of the five participants, three were nurse practitioners (60%) and two were physicians (40%). Data was analyzed by calculating pre and post test scores. The total score a participant could get was 90. The average score pre-education was 53 and the average score post-education was 72. The project resulted in a 35% increase in knowledge.

Discussion: This project implemented online education for providers regarding the PDMP/Narxcare™ and WHO pain ladder. The providers took a pre-education survey and post-education survey. These surveys allowed providers to rate their knowledge of clinical practice guidelines, the PDMP/Narxcare™, and their assessment on whether or not they felt proficient in prescribing opioid pain relievers. The low provider participation rate was felt, in part, due to the unprecedented surge in community COVID-19 cases at the time of project implementation. Despite limitations and barriers, results showed providers perception regarding their knowledge of the PDMP, WHO pain ladder and opioid prescribing improved after six weeks. Additional studies with a large population are needed to determine if this education would benefit all providers and not just hospital-based ones.

Keywords: Opioid pain relievers, PDMP, WHO pain ladder, opioids, opioid prescribing

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Stewardship

Introduction

Background

In the early 1990s, pharmaceutical companies released information to the public and medical professionals that patients could not become addicted to opioid pain relievers (OPRs) (Califf, Woodcock, and Ostroff, 2016). After this ‘reassurance’, providers began prescribing OPR at an increased rate. In 1995, Dr. James Campbell urged health care providers to treat pain as the “fifth vital sign” (Scher, Meador, Van Cleave & Reid, 2018). The implementation of pain as the fifth vital sign led to other organizations implementing national strategies to address pain, however, these initiatives have fallen tremendously short. Shortly after the implementation of pain as the fifth vital sign, several pharmaceutical companies began marketing a new opioid pain reliver (OPR), their sustained-release Oxycontin (Lockwood, 2018). Pharmaceutical companies were truly convinced that the sustained-released formula would aid in stabilizing blood levels of the narcotic thus reducing the peaks and troughs. The rationale was that this new drug would greatly reduce addiction to opioids. While sustained-release opioids offer benefits for managing chronic pain, there have been undeniable and unforeseen consequences of pharmacological innovations over the last twenty-five years.

In 2014, over 47,000 Americans died from a prescription opioid overdose (Vowles et al., 2015). Vowles et al. (2015) found that rates of misuse of OPRs ranged from 12-29% during 2014. While there is no debate that patients need OPRs, especially in patients with a terminal illness, the over usage of OPRs has led to the current Opioid Crisis. Concerns arise from patients abusing and misusing OPR, thus leading to a decrease in efficacy and requiring stronger pain

relievers. The number of opioid related overdose deaths in 2017 was six times higher than they were in 1999 (CDC, 2019). In 1986, well before the ‘pain as the fifth vital sign movement’, the World Health Organization (WHO) released a stepwise simple approach to prescribing opioid pain relievers (Figure 1) (Schepers, 2017). This approach to prescribing opioid pain relievers (OPRs) gives providers two steps to utilize before opioid’s should be prescribed. Since the origination of the WHO pain ladder other guidelines have come around to aid prescribers in managing pain. It has been determined that the United States is currently in an opioid epidemic (CDC, 2018). Emergency rooms are seeing an influx in the number of visits from patient’s requesting opioid pain relievers (Hoppe et. al, 2015). Medicaid has reported costs for opioid use disorder reached \$3 billion in 2013, whereas in 1999 it was \$919 million (Haffajee et. al, 2018). Opioid use disorder and opioid abuse imposes considerable financial burden and is estimated to continue increasing over time.

The Department of Justice developed the Prescription Drug Monitoring Program (PDMP) to assist in prosecutions of criminal violations of the Controlled Substances Act (Hoppe et. al, 2015). As of 2018, 49 states have enacted PDMPs. PDMPs are state-based and state-specific. Some states are currently only monitoring Schedule Two through Schedule Three drugs, while others have recently implemented monitoring Schedule Five in addition to Schedule Two through Schedule Four. Forty-nine of 50 states, only 13 have state mandates where the providers must register and utilize the PDMP (Bulloch, 2018). Forty-nine (out of the 50 states) states utilize PDMPs in some capacity, Missouri is the only state that does not currently have a PDMP. The laws regarding the PDMP are voted on per state and regulations vary based on whether there are laws mandating usage. Currently, there are no Federal regulations concerning PDMPs. Research has shown that state mandates play a pivotal role in lower prescription opioid rates and

abuse rates (Vowles et al., 2015).

The Identified Problem

The DNP project focused on a single community-based hospital, which serves a population of 27,000 individuals located in the southeastern region of the United States. The town is part of a sister city metropolitan area which serves roughly six counties. The hospital recently implemented the PDMP/NarxcareTM into their electronic health record (EHR) with minimal education regarding the new feature and the importance of the PDMP and adherence to a clinical practice guideline (CPG). Research has shown that most providers do not adhere to CPGs due to personal beliefs about pain medication and lack of knowledge regarding CPGs (Hossain et. al, 2020). Providers and pharmacists at the chosen community-based hospital have reported that there is no current hospital-endorsed CPG for prescribing opioid pain relievers in the inpatient setting and that providers are prescribing opioid pain relievers based off judgement currently and not based off utilizing current evidence-based practice. One research study reported that 84% of providers felt that their prescribing rates decreased after the implementation of a CPG (Daniel et al., 2016). The most commonly prescribed opioid pain relievers, according to the CDC, are methadone, oxycodone, and hydrocodone (CDC, 2017). Florence et al. reported that in 2013 the total spending for health care and substance abuse treatment totaled over \$28 billion (2016). Facilitators for the opioid crisis included “safety” of the new opioid pain relievers, overprescribing by providers; ease of access, and at the time lack of electronic health records (Makary, Overton & Wang, 2017). The National Institute on Drug Abuse reported that in 2018 opioids were involved in over 46,802 deaths (2020).

Hossain et al., conducted a meta-analysis on prescribed adherence to CPG for prescribing OPRs (2020). The meta-analysis showed that of the 2,104 healthcare providers that were

surveyed 59.2% of them reported a self-awareness to CPGs and 61.4% of them reported following recommendations put in place by CPGs (Hossain et al., 2020).

There are several guidelines available for managing pain of any nature: chronic, acute, cancer, non-cancer, low back, hip, and joint to name just a few. Most of these guidelines recommend starting pain management with Nonprescription Opioid Pain Relievers (NOPRs). Thorough research is conducted prior to CPGs development and practice use. Guidelines are evidence-based and describe how OPRs should be prescribed. It has proven to be quite difficult to find data determining whether physicians, hospitals, or clinics are following CPGs for managing pain and prescribing OPRs. The lack of implementation of CPGs to guide providers in adequately prescribing OPRs can be an issue when trying to combat the current opioid epidemic. This scholarly project looks to examine the effectiveness of implementing the State of Alabama PDMP into the EHR and a CPG for prescribing OPRs.

Problem Statement

According to the literature and needs assessment, this DNP project was designed to provide education to providers on utilizing the PDMP, which was newly embedded within the EMR, as well as measuring adherence to the WHO pain ladder guidelines and the effects these had on providers' perceptions regarding their knowledge. The purpose of the DNP project was to educate providers regarding the PDMP and encourage adherence to CPGs when prescribing OPRs. The participants completed a pre and post-education survey to determine their knowledge and usage of the PDMP.

Organizational "Gap" Analysis of Project Site

The site of this project was in a community hospital located in the Southeastern part of Alabama. The hospital recently implemented a new form of documentation in the Cerner

charting system in June 2020. This included the incorporation of the PDMP/Narxcare™.

Narxcare™ is a technology platform that assists providers and pharmacists when looking at a patient's opioid usage. Narxcare™ takes the information from the PDMP and gives the patient a number from 0-999. The higher the number the more likely the patient is to have an addiction to OPRs or suffer from opioid use disorder. The lower the number the more opioid naïve the patient. Depending on the number, the provider can determine whether they need to probe further into the patient's opioid usage background.

Prior to the implementation of Narxcare™ the local hospital was not mandating providers utilize the PDMP or a CPG. Even with the implementation of Narxcare™, the hospital is not mandating providers utilize the PDMP. The providers are using best discernment on which OPRs should be prescribed. No data is available regarding the number of OPRs prescribed in the year prior to the implementation of Narxcare™. Providers were polled regarding their own personal usage of the PDMP outside of the charting system and the providers reported minimal usage if any at all.

Review of the Literature

To explore the best practice for lowering the prescription rate of OPRs by utilizing the PDMP and a CPG to guide prescribers an extensive literature review was done. Several databases were utilized along with several search terms. Search terms utilized included “analgesic”, “opioid”, “opioid pain relievers”, “clinical practice guideline”, “prescription drug monitoring program” and “implementation”. The literature search resulted in roughly 65 articles, which were narrowed down to include in total twelve articles. The article inclusion criteria included those published in the most recent five years, looked at PDMPs and provider adherence, education on PDMPs, and lowering prescription rates of OPRs.

Provider Adherence

Hossain et al conducted a systematic review and meta-analysis on the prescriber adherence to a CPG when it came to prescribing OPRs (2020). The systematic review and meta-analysis followed the PRISMA guidelines with a focus on prescriber adherence to CPGs for prescribing OPRs. Inclusion criteria for the meta-analysis included reporting providers who had privileges to prescribe OPRs, reporting adherence to recommendations on prescribing opioids, and the studies must have pertained to chronic non-cancer pain (CNCP). The meta-analysis reviewed 383 full-text articles, of those only 38 met inclusion criteria (Hossain et. al, 2020). The meta-analysis identified 11,871 providers across 17 studies and looked at their prescribing behaviors. A majority of the providers were primary care physicians, also included were nurse practitioners, physician assistants, and other (which was not identified) (Hossain et al., 2020). Of the providers identified, only 59.2% of them reported self-awareness of CPGs and 61.4% reported following the recommendations put in place. The study also looked at the adherence and usage of urine drug screens and pain assessment tools. The meta-analysis provided significant information regarding provider adherence to CPGs when prescribing opioid pain relievers. The meta-analysis presented results showing that 40% of the providers participating consulted a drug-monitoring program before prescribing OPRs. The study also demonstrated of the charts reviewed for the study only 40% had adequate documentation regarding OPRs. Overall, the meta-analysis indicated that providers' adherence to a CPG and PDMP varied among the providers.

In one randomized control trial, Meisel et al. looked at emergency physicians and the effectiveness of narrative vignettes versus guidelines summaries when educating providers on clinical practice guidelines (2016). The study indicated that narrative vignettes intrigued

providers and there was an increase in the number of visits from providers to a website in which the CPG could be located for physician review (Meisel et al., 2016). The study also looked at utilization of guidelines once the physicians were provided education. The study saw an increase in the utilization and support of CPGs by the physicians (Meisel et al., 2016). In the control group only 248 visits were found to the websites for assistance with enrolling in the PDMP as opposed to the 744 gross visits from the physicians in the experimental group. The assistance in enrolling into the PDMP increased provider utilization of the PDMP by 7.0% (Meisel et al., 2016).

Opioid Prescribing Rates

Daniel et al conducted a retrospective chart review in which investigators looked at opioid prescribing rates prior to and post guidelines implementation (2016). Of the physicians participating, 84% felt that their prescribing rates of OPRs decreased after guideline implementation. Guidelines are evidence-based research showing best practices. The chart review conducted by Daniel et al. shows that guidelines are easy ways to aid in lowering prescribing rates of OPRs by implementing hospital endorsed CPGs (2016). CPGs guide providers and staff on best practices in managing chronic and acute pain.

Hoppe et al. conducted a retrospective cohort study that examined prescribing habits in several emergency rooms (ER) over a one-week period (2015). This study looked at the number of opioids prescribed and even examined the different types of opioids prescribed. Hoppe et al. showed that over the course of one week 3,284 prescriptions for opioids were given to patients visiting for the ER (2015). According to Hoppe and colleagues the reason for opioid usage varied from different types of pain including low back pain, dental pain, neuropathic pain, sciatic pain, and even for headaches. Additionally, this study demonstrated that the ER providers did not

utilize a CPG for prescribing opioids. The study also showed that in multiple instances the patients were sent home with two or more prescriptions for different opioids (Hoppe et al., 2015). The last retrospective cohort study examined patients diagnosed with Alzheimer's and their usage of OPRs and prescriptions (Oh et al., 2019). This study examined the differences among patients and what circumstances contributed to increased risk in developing chronic opioid usage. The study showed that white females over the age of 40 were more at risk to have chronic opioid usage and be on more than one opioid (Oh et al., 2019). Knowing which patients are at an increased risk for chronic opioid usage can also guide prescribers in how they prescribe OPRs to their patients and make certain their patients are 'starting low and go slow'.

The quasi-experimental analyses study looked at individual-level health insurance claims for OPRs and compared states who have robust PDMPs and those states that do not have robust PDMPs. The quasi-experimental analyses looked at four states (Kentucky, New Mexico, Tennessee, and New York) that had very robust PDMPs. These states were compared to neighboring states (Missouri, Texas, Georgia, and New Jersey), which do not have robust PDMPs (Haffajee et al, 2018). The study looked at Kentucky, New Mexico, Tennessee, and New York as the states with the robust PDMP. The study then utilized deidentified Optum data to aid in quantifying prescribed OPRs. The study noted that it was limited in its knowledge because it was utilizing administration date and not clinical data. The study ultimately showed that by the end of 2014 the states with robust PDMPs had seen significant declines in opioid dosages. In Kentucky there was a significant decline in the number of enrollees filling OPRs.

Provider Education

The literature review included a qualitative interview. This interview conducted 20 interviews among ER physicians. The interview helped identify barriers to utilizing a CPG and

helped determine ways to improve implementation of a CPG (Penn et al., 2019). The interview study showed barriers to implementation including concerns regarding patient satisfaction scores, guidelines containing minimal information, and lack of usage for the prescription drug monitoring program (PDMP). The providers also identified ways to improve implementation, such as more institutional responsibility and increased patient involvement (Penn et al., 2019).

A two-month public health campaign that focused on education of judicious opioid prescribing in New York found that through education providers felt more confident and rated themselves as having a better understanding on prescribing opioids based off a CPG than before the education session (Kattan et al., 2016). Education is an important part of the healthcare field. Evidence is constantly changing, so ensuring providers and patients are educated on the most current evidence will ensure better quality care and lower prescribing rates of OPRs.

A cross-sectional study that was discovered during the literature search was conducted over a fourteen-month period, from February 2014 to April 2015. During the study period physicians took part in completing an electronic survey that was accessed via scientific society websites ((Duenas, Salazar, Sanchez, De Sola, Ojeda, and Failde, 2018). The survey was divided into separate sections which collected general data, data on physician training and attitudes toward pain, and patient population. This cross-sectional study provided data that showed 96.5% of the physician participants had reported receiving training on CPGs, with 76.3% reported lacking knowledge on how to effectively manage chronic pain (Duenaset al., 2018). The survey also showed that over 75% of the participating physicians reported their training on CPGs came from online courses as opposed to 10.1% who reported receiving training during medical school (Duenas et al., 2018).

Prescription Drug Monitoring Programs

In a study that was conducted over five years, from January 2011 to December 2015, Bachhuber et al., examined the impact that use mandates for PDMPs had on the effect of prescribing OPRs. The study showed that the implementation of a mandate for the utilization of a PDMP was associated with significantly lower rates in overall prescribing of OPRs and lower rates in problematic prescribing behaviors (Bachhuber et. al, 2019). The timed series analysis also showed lower rates of patients having more than five prescribers and five different pharmacies when looking for OPRs.

In a related study, Findley et al. conducted a pre-implementation feasibility and needs assessment. The study directed twenty-six interviews with providers assessing baseline knowledge of opioid risk mitigation (Finley et al., 2018). The qualitative study revealed that providers reported that most of their knowledge regarding PDMPs came from ‘on the job’ training and not in medical school. This study also highlighted the lack of education being offered to providers regarding opioid risk mitigation. Additionally, the study revealed that a most providers reported that they were unfamiliar with PDMPs and had no prior experience with utilizing a PDMP (Finley et al., 2018). This feasibility study highlights the need for continued education regarding PDMPs for providers. If providers are not educated, we cannot expect them to utilize new technology to provide better patient care.

A brief research report by Fink et al. described providers prescribing patterns utilizing the PDMP in Oregon. In Oregon there are more than 5,935 prescribers registered in the PDMP (Fink, Deyo, Hallvik, and Hildebran, 2018). The report utilized link software to access the Oregon PDMP and analyzed prescriber type, high-risk prescription, hospitalization and mortality. The study showed that most patients had multiple providers prescribing high risk

opioids (Fink, Deyo, Hallvik, and Hildebran, 2018). The study did demonstrate that patients had higher risk of hospitalization and mortality rates when seeing multiple providers (Fink, Deyo, Hallvik, and Hildebran). By utilizing the PDMP, providers can assess a patient's recent opioid prescription history. The knowledge of whether the patient is utilizing multiple providers can aid in the decrease of hospitalizations and mortality.

Evidence-based Practice

Overall effectiveness of the PDMP varies from state to state. The states with mandates on providers to utilize the PDMP tend to have lower rates of opioid abuse and opioid use disorder as opposed to those who do not have mandates in place (NIDA, 2020). Some states block access to criminal investigators and prosecutors in the absence of a court-order while other states limit the class of medications able to be reported to providers (Kattan et al., 2016).

As part of my DNP project, I provided education based on current evidence highlighting the importance of the utilization of the PDMP in the inpatient setting. In Alabama, medical providers, pharmacists, and law enforcement professionals have access to the PDMP. Currently, Alabama does not require its providers to be registered or to access the PDMP before prescribing OPRs. Some PDMPs limit which healthcare providers can have access to the PDMP. The American Society for Addiction Medicine (ASAM) provides recommendations to providers regarding the PMDP.

The second part of my project included a review of current prescribing guidelines, specifically, the WHO pain ladder. The WHO pain ladder was originally created to assist in managing pain in cancer patients. The pain ladder rests on five simple recommendations which are focused on ensuring the correct usage of OPRs and ensuring the lowest morphine equivalent

of opioids are being prescribed.

Each state has their own advisory board that monitors their PDMP. The DNP project was implemented within a single agency in Alabama. In Alabama the advisory board falls under the purview of the Department of Health. As of 2018 the State of Alabama has 17,522 DEA registered prescribers and only 1,421 dispensers.

The PICOT statement for the project is as follows: In hospital-based providers (P), does the education and implementation of a Prescription Drug Monitoring Program and the World Health Organization Pain Ladder (I) improve provider knowledge, adherence to the PDMP and lowering prescription rates of opioid pain relievers (O) following six weeks of implementation (T)?

Theoretical Framework or Evidence-based Practice Model

The Theory of Planned Behavior (TPB) is a mid-range theory that looks at an individual's intention to engage in a behavior at a specific place and time (Appendix A). This project is looking at educating providers on the behavior of accessing the PDMP and adhering to a CPG when prescribing OPRs. The TPB has six constructs that represent a person's control over an actual behavior. These constructs include a provider's attitudes, behavior intention, subjective norms, social norms, perceived power, and perceived behavioral control. The TPB can aid in designing the educational aspect of this project to address and attract providers into changing their behaviors regarding accessing the PDMP and adhering to a CPG. Looking at providers' attitudes to the PDMP and a CPG will help guide the education to engage the providers and motivate the providers to utilize the PDMP and CPG.

The TPB (Figure 1) examines behavioral intention specifically, at motivating factors. Discussion with stakeholders about motivating factors for providers regarding the PDMP and

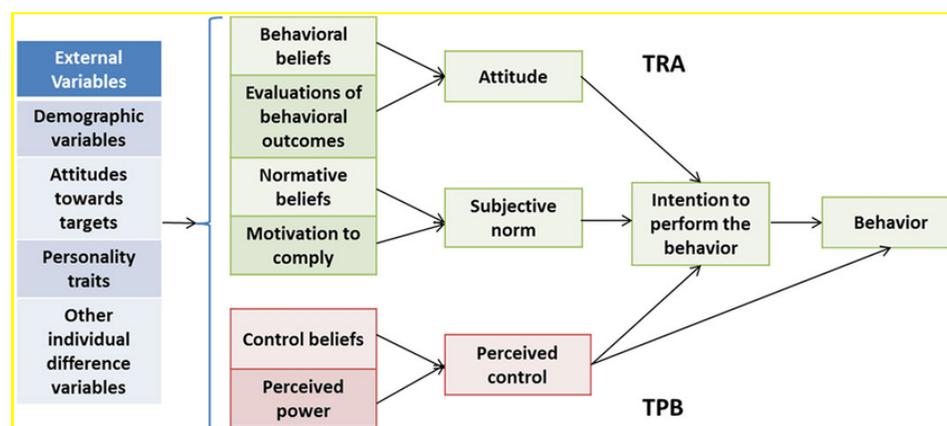
CPG was an important part of this project. Motivation is key in ensuring the providers utilize the PDMP and CPG.

Subjective norms was a major aspect of this project. Providers currently see the opioid crisis as a “negative” event. Buchman, Leece, and Orkin report that the stigma behind the opioid epidemic has affected patients receiving appropriate care and has even hindered providers from guiding patients to evidence-based treatment of opioid use disorder (2018). Considering the subjective norms and providing adequate education on the reality of the PDMP, the CPG, and the opioid crisis will hopefully empower the providers to utilize the PDMP and allow it to guide their prescribing habits.

The six constructs of the TPB will guide the primary investigator in developing a thorough educational program for providers regarding the PDMP and the CPG. The goal of the project is to educate providers and empower them to utilize the PDMP which will guide them to appropriately prescribe OPRS and manage their patients’ pain levels.

Figure 1.

Theory of Planned Behavior Graph



Source: https://www.researchgate.net/figure/The-theory-of-reasoned-action-and-planned-behavior-Revised-from-Health-behavior-and_fig1_308784496

Goals, Objectives and Expected Outcomes

The goals for this project focused on the improvement of providers' education and knowledge on the PDMP and CPG. These goals were evaluated using pre-education and post-education surveys. Presently, the hospital, where the DNP project was implemented does not monitor the utilization of the PDMP or the number of OPRs prescribed so the providers were asked to self-report through the surveys (Appendix B). The surveys were administered prior to the individual education and then six to eight weeks after education. This methodology provided time for new behaviors to develop and see over time how the providers feel their OPR prescribing habits have changed.

Methods (Plan)

Physicians and nurse practitioners who are a part of the hospitalist provider group were recruited for the educational intervention. The hospitalist group was selected as they see a majority of the patients in the local hospital and can have the biggest impact on practice change by implementing new prescribing behaviors. A total of 15 providers were recruited and enrolled in the project. Inclusion criteria included being a hospitalist-based provider, having a DEA license, having an unencumbered medical license (MD, NP, or PA), and have access to email. Exclusion criteria was solely the lack of a DEA license. Providers that were enrolled were given a pre-education and post-education survey that will look at their beliefs, utilization, and adherence to the PDMP and WHO pain ladder. The surveys were fifteen questions and were based on the Likert scale.

In between the surveys, the providers watched a 20-minute, 15-slide Power Point presentation on the PDMP/Narxcare™ and WHO pain ladder. After the education presentation, providers were given a six week time-period to implement any changes to their practice from the knowledge gained from the education.

Project Design

The Doctorate of Nursing Practice (DNP) project focused on the implementation of the PDMP in the current charting system at a single community hospital in Southeast Alabama. Currently the charting system, Cerner™, does not have full access to the PDMP. The project focused on improving the current practice with the hospitalists at the local hospital and prescribing OPRs. Education sessions were provided to the participants remotely about the PDMP and the WHO pain ladder. Education sessions were conducted online via Qualtrics™ and Power Point™ slide due to the current Corona Virus (COVID-19) pandemic which caused the local hospital limiting group gatherings at this time. Qualtrics™ is an online platform that allows for schools, companies, and students to gather feedback and data. This may or may not be done anonymously. The providers took the survey pre-intervention and six to eight weeks post-intervention

Project Site and Population

The project took place at the single community hospital in Southeast Alabama with the hospitalists and their nurse practitioners. The hospital is a public hospital that has 340 beds and employs over 3,000 employees. The hospitalists group employs over 20 hospitalists and five nurse practitioners. The hospitalist group is the only hospitalist group at the hospital. The hospital provides services to four surrounding counties and accepts many types of insurances. BlueCrossBlushield and Healthgrades have recognized the hospital as one of the top hospitals in

the area for cardiovascular and orthopedic services. The project required the utilization of the current charting system and the new incorporation of the PDMP.

91.3% of the population in Southeast Alabama where the hospital is located has healthcare coverage. 12.2% of the population has Medicaid coverage, and 8.23% has Medicare coverage. The community where the hospital is located is 70.6% Caucasian, with a total population of 164,542.

Measurement Instruments

For this project providers were given a pre-educational intervention survey and a post-educational intervention survey to assess provider knowledge. The KnowPain-12 survey was created to assess provider knowledge on pain management (Gordon et al., 2014). The KnowPain-12 survey was given to the providers to assess their perceptions of their knowledge before intervention and post-intervention. The KnowPain-12 survey is a twelve-question survey that allows participants to answer utilizing a six category Likert-type scoring scale. The Likert scale is a psychometric scale that aids in scaling responses and allows responses to be easily interchanged. The scores range from 1-6 with 1 being strongly disagree and 6 being strongly agree. This allowed the providers to have “scores” and for these “scores” to be compared at the completion of the project. The surveys consisted of 15 questions and focused on the providers’ personal knowledge about the PDMP, WHO pain ladder, and their beliefs regarding pain management. Dr. Debra Gordon is the primary author on the development of the KnowPain-12. Dr. Gordon was contacted regarding the usage of KnowPain-12 for this project and agreed to allow the project to utilize the survey and add any additional questions that benefitted the project. The post-education intervention survey assessed whether the providers’ perception of their knowledge increased and whether or not attitudes changed when it comes to prescribing OPRs in

relation to the WHO pain ladder. Currently the local hospital does not utilize any data management programs that track the prescription rates of different opioids being prescribed by individual providers. The providers were questioned on how they felt their prescribing habits have changed post-intervention. Descriptive statistics will be utilized for data analysis with the highest score possible being a 90.

Data Collection Procedures

Pre-Intervention

Physicians and nurse practitioners who are a part of the hospitalist provider group were recruited to participate. Participation is not required by the hospital and was voluntary. Providers that agreed to participate provided their email address and the pre- and post-intervention surveys were delivered via a secure link to a survey on Qualtrics™. Qualtrics™ is a website that allows surveys to be created and for data to be stored confidentially. Qualtrics™ allowed for their responses to be submitted and stored securely so none of the providers' email addresses could be compromised. This allowed for protection of the participants' responses and personal email addresses. No personal health information was collected. Data was reported in an aggregation. Once the pre-intervention surveys were completed the providers were sent another link to the online education presentation.

Intervention

The educational sessions occurred within one to two weeks after the pre-intervention survey. The educational presentation consisted of the WHO pain ladder and simple steps on how to navigate the PDMP/Narxcare™ in the EHR. The educational presentation lasted twenty minutes and consisted of 15 slides that included detailed explanation regarding the importance of the PDMP and WHO pain ladder. The providers were guided on the PDMP/Narxcare™ numbers

and how to utilize the reporting from the PDMP/Narxcare™ to guide their prescribing habits. Once the education was completed, the providers were then given six to eight weeks to utilize their knowledge and implement any changes in their practice.

Post-Intervention

Six to eight weeks post-education the providers continued to practice and hopefully implemented their new knowledge into practice. At the end of the six to eight-week period, the providers received an email with a link to the post-education survey via Qualtrics™. Providers were given up to two weeks to complete the post-intervention survey. This allowed for additional time for the providers to complete the survey and adequately answer the questions.

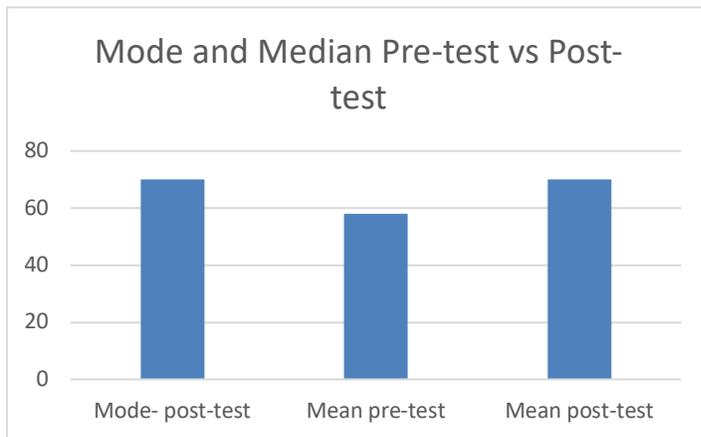
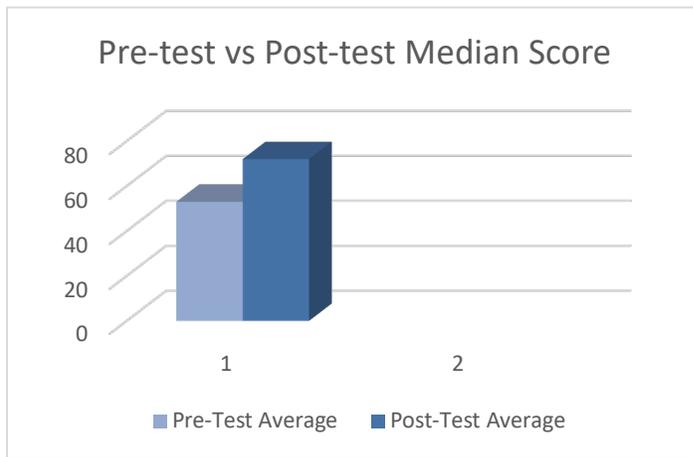
Data Analysis

Data analysis for DNP project was conducted using descriptive statistics measures of Central Tendency. Descriptive statistics were utilized for analyzing the data due to the ability of being able to summarize a portion of the data collection. Measures of central tendency are commonly used for observations of data and for comparing one group of results against another group (Mishra et al., 2019). Central tendency utilizes mean, median, and mode to analyze data for the project. Mean is the average value of a data set, while mode is the value that occurs most frequently in the data set, and finally median is the middle most observed value in the data set (Mishra et al., 2019). Data was entered into the spreadsheet and then calculated for mean, median and mode (Figure 2). The mean score before education was 53 and the mean score post education was 72. While there were only 5 participants for the completed project, the scores did improve roughly 20 points after education was completed. The best score possible was a 90. The total score was calculated by giving each answer a numerical value based on the answer of “I strongly disagree” to “I strongly agree” (Appendix B). If participants had selected “I strongly

agree” for each of the 15 questions they would have received 6 points for each answer, thus equaling the highest possible score of 90. The data showed there was improvement in the providers’ knowledge after education was provided on the PDMP and CPG. Data also showed that there was no mode for the pretest data value set.

Figure 2.

Results of Data Analysis



Note. Data analysis results of DNP project

Cost-Benefit Analysis/Budget

Cost for this project were minimal. Surveys were given via Qualtrics™ which is a free

survey website. My time was also factored into the cost. I spent roughly 8 hours a week following up on the education provided to ensure providers were not confused and felt they had a resource with the new knowledge. There was no cost associated with completing the project at the local hospital. There could be a potential decrease in costs for patients regarding prescriptions should modified prescribing occur. Provider time was also factored into this cost-benefit analysis. The most time-consuming portion of this project for providers was the educational content, this was roughly 20 minutes and was done on a voluntary basis. Participants were not paid for their time in the project.

Timeline

The project proposal was approved October 2020. The timeline for the project started in November 2020 and ended in December 2020. Unfortunately, recruitment and data collection could not begin until November due to additional provisions being required for approval due to the COVID-19 Pandemic. Data Analysis and interpretation was conducted through the middle of January 2021. Finally, dissemination of findings was submitted in March 2021.

Ethical Considerations/Protection of Human Subjects

The University of Alabama (UA) Institutional Review Board (IRB) approval was obtained prior to initiating the project. All participants' identities were protected in that the only identifying information collected was provider email. Provided email addresses were stored in a password protected file on a password protected laptop. No personal health information was obtained during this study. A possible ethical consideration for this project was the fact that the primary investigator is a nurse practitioner providing education to medical physicians and this could lead to some questioning the scientific validity of the project. The identifiable risk to

patients in this project was the possibility of providers changing their opioid prescribing behaviors. With this consideration, providers were strongly educated on the importance of not completely ceasing OPRs for patients.

All electronic files containing identifiable information were stored on the HIPPA secure UA Box.

Results

A total of 15 participants were recruited for the project at baseline. Unfortunately, only five completed the full project which resulted in a completion percentage of 33%. Ten providers completed the initial survey but failed to complete the education and post-education survey. This showed an initial participation percentage of 67%.

Of the five participants, three were nurse practitioners (60%) and two were physicians (40%). There was an overall great participation and completion of the project from the nurse practitioners (NPs) vs physicians. Out of the providers recruited for the project there were only five NPs recruited as opposed to ten physicians. It is unsure of why the NPs showed greater participation. Speculation is that physicians were overwhelmed and required to work extra days during the third surge of the Coronavirus pandemic. Once surveys were returned the surveys were analyzed by calculating the score by assigning each answer a number 1-6. The total score a participant could obtain was 90. The average score before education was 53 and the average score after education was 72. The project showed an increase in knowledge by roughly 20%.

Providers were encouraged to leave feedback on the post-education survey. Feedback obtained from providers included “feel more confident in using Narxcare™ to access the PDMP”, “gained a better understanding of Narxcare™”, and “plan on adhering to a clinical practice guideline when prescribing opioids”.

Discussion

The goal of this project was to improve provider knowledge on the importance of the PDMP and utilization of a CPG when prescribing OPRs. The project ran for six weeks total from beginning of implementation until the post-survey was sent to providers.

Unfortunately, not all 15 recruited providers completed the project. The start of implementation began in December 2020, right as a third surge in COVID-19 cases was beginning. The local hospital saw a dramatic rise in number of cases and ended up having to open an additional ICU and additional rooms in the hospital to accommodate the influx of COVID-19 cases as well as to care for the traditionally sick patients being admitted. The two previous COVID-19 surges did not exceed having 75 COVID positive patients in the hospital. Unfortunately, during the third surge the hospital saw over 100 COVID positive patients.

Verbal communication and follow-up emails was provided to providers who had completed the initial pre-education survey to complete the education and post-education survey. Unfortunately, no additional surveys were answered.

The data analysis showed significant improvement in provider knowledge regarding Narxcare™/PDMP and the WHO pain ladder. This was encouraging and helped guide discussions with stakeholders regarding the implications for the project. Implications for the project results include, after discussion with several stakeholders, improving provider continued education and onboarding education of new providers. Currently, new providers do not have onboarding education nor do current providers have continued education on changes in charting or policy changes. Several stakeholders agreed that there should be discussion about starting onboarding training and continued training with providers. Langley, Dority, Frase and Hatton (2018) conducted a study on a new on-boarding education program for Advanced Practice

Providers (APP). The study regarding on-boarding education for APPs revealed an improvement in education and even showed improvement in retention among the providers over a three-year period (Langley, Dority, Frase, and Hatton, 2019). Physicians, Nurse Practitioners, Physician Assistants, and nurses must complete so many continued education hours per year to renew their certification and licensure. Kattan et al. conducted a study saw that through education, providers felt more confident and rated themselves as having a better understanding on prescribing opioids based off a CPG than before the education session (2016). This DNP project helps to solidify that on-going education with providers' increases knowledge regarding PDMPs and prescribing opioids. By incorporating continuing education and on-boarding education the hospital could aid in supplying a portion of those hours to their providers and aid in retention in the long-term as well as ensuring best evidence care for patients.

Strengths of the project included the educational sessions being available online. This allowed providers to participate from wherever they were, ease of access to the educational content, and anonymous responses. Weakness included lack of generalizability, impact of the COVID-19 pandemic causing a lack of participation, and, thus, a small sample size. It is believed a larger sample size would be beneficial to seeing how the education is implemented across the different specialties. Barriers to this project included the ongoing COVID-19 pandemic. The pandemic limited the ability to do group educational sessions and meet with the participants to provide guidance on implementing the educational content into practice.

Conclusion

The opioid crisis is still an ongoing issue. Some states require their providers to utilize PDMPs when prescribing OPRs. Research has shown that through the utilization of a PDMP prescribing of OPRs tend to lower the number of prescriptions over time. Currently, Alabama

does not require its providers to utilize the PDMP. The local hospital where this project was conducted recently incorporated Narxcare™ into their charting system making provider access to the PDMP easier and streamlined. Providers can now access the PDMP while charting and order medications. Education on the importance of accessing the PDMP when prescribing OPRs showed an improvement in provider knowledge and will hopefully over time lead to more judicious prescribing and lower opioid prescribing rates.

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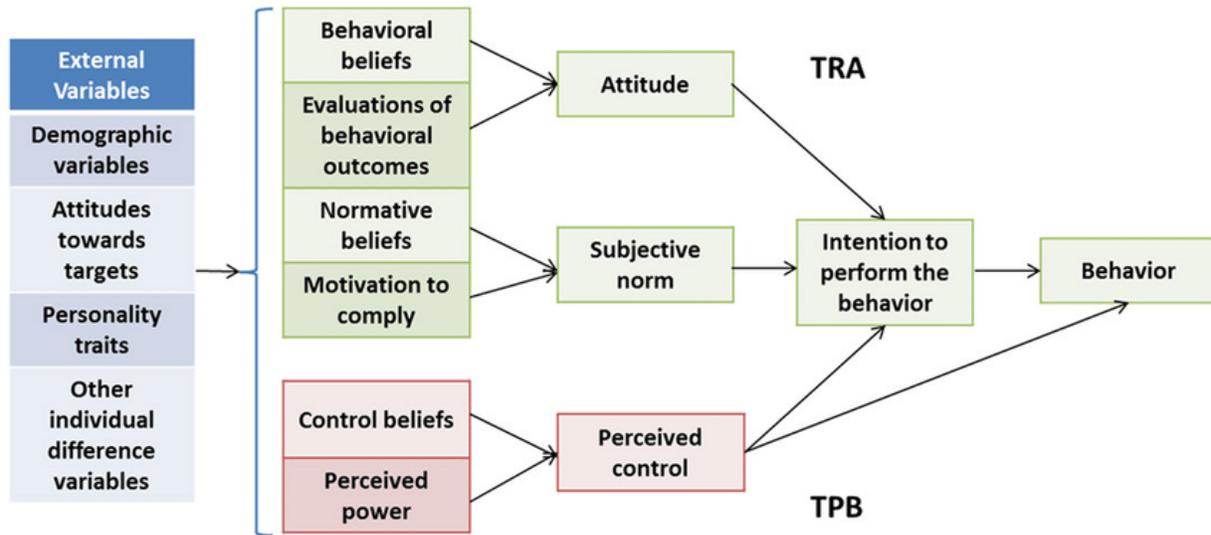
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Appendix A

Theory of Planned Behavior



Source: https://www.researchgate.net/figure/The-theory-of-reasoned-action-and-planned-behavior-Revised-from-Health-behavior-and_fig1_308784496

Appendix B**Pre and Post Survey**

1. When I see consistently high scores on pain rating scales in the face of minimal or moderate pathology, this means that the patient is exaggerating his/her pain.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

2. In chronic pain, the assessment should include measurement of the pain intensity, emotional distress, and functional status.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

3. There is good evidence that psychosocial factors predict outcomes from back surgery better than the patient's physical characteristics.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

4. Early return to activities is one of my primary goals when treating a patient with recent onset back pain.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

5. Antidepressants usually do not improve symptoms and function in chronic pain patients.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

6. Cognitive behavioral therapy is very effective in chronic pain management and should be applied as early as possible in the treatment plan for most chronic pain patients.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

7. I feel comfortable calculating conversion doses of commonly used opioids.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

8. Long-term use of NSAIDs in the management of chronic pain has higher risk for tissue damage, morbidity, and mortality than long-term use of opioids.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

9. There is good medical evidence that interdisciplinary treatment of back pain is effective in reducing disability, pain levels, and in returning patients to work.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

10. I believe that chronic pain of unknown cause should not be treated with opioids even if this is the only way to obtain pain relief.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

11. Under federal regulations, it is not lawful to prescribe an opioid to treat pain in a patient with a diagnosed substance use disorder.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

12. I know how to obtain information about both state and federal requirements for prescribing opioids.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

13. I utilize the PDMP before prescribing opioid pain relievers.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

14. I adhere to a clinical practice guideline when prescribing opioid pain relievers

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

15. I feel my knowledge on the PDMP and WHO pain ladder is sufficient.

Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
6	5	4	3	2	1

Appendix C

Projected Budget Table

<i>Item</i>	<i>Quantity</i>	<i>Cost</i>
Survey Monkey	Two survey links	\$0
My time	64 hours (\$45/hr)	\$2880
Statistician consult		\$50
<i>Total estimated cost</i>		<i>\$2930</i>

Appendix D**Timeline of Proposed Project Events**

Mid-August 2020	Approval of proposal and administration of pre-intervention survey
Late August-November 2020	Education and provider implementation
Beginning to Mid-November 2020	Administration of post-intervention survey
November 2020- January 2021	Data analysis and interpretation of outcomes
March 2021	Dissemination of findings